SCIENCE & EDUCATION
Impact
Benefits from USDA/Land-Grant Partnership

Clean Air Quest

Striving for better air, brighter future.

Over the past three decades, the United States has spent more than $523 billion to clean up the nation's air. The U.S. Environmental Protection Agency estimates that investment has saved hundreds of thousands of lives and trillions of dollars' worth of productivity. But there is still a lot more work ahead. USDA and the nation's land-grant universities are working to improve air quality.

Payoff

- **Furor over manure.** Livestock and poultry production systems are a big part of the rural economy in Texas, but odors, dust and gases from these operations have led to increased environmental concerns. Research conducted by **Texas A&M** scientists helped operators find ways to reduce dust in feedlots significantly, saving about $4 million annually in EPA emissions fees. Public anxieties about livestock odors that sometimes flare into conflict led **Nebraska** bioengineers to develop the Nebraska Odor Footprint Tool. This software calculates how far livestock operations should be from neighbors to avoid odor-related disputes. The tool is being developed to advise livestock producers planning to expand existing facilities or build new ones.

- **Understanding our emissions. Ohio State** researchers are studying air pollution from large livestock farms and its potential for causing respiratory diseases in people. Unfortunately, scientific data are scarce on the extent of this pollution and how far it travels. Researchers are measuring air emissions from large livestock farms and developing technologies to minimize dust and ammonia. A similar project focuses on finding ways to reduce the dust and ammonia created when ammonia is converted into fertilizer. **Maine** researchers are measuring emissions of volatile organic compounds from wood-drying operations and their effects on human health. Their work has helped operators meet EPA mandates, resulting in savings of about $600,000 at 17 mills in the state.

- **Clamping down on drift**. Growers use many kinds of pesticides to produce crops efficiently, but unintentional spray drift may harm adjacent crops and neighboring people. **Mississippi State** researchers found new agricultural spray systems, spray

RESEARCH, EXTENSION AND EDUCATION AT WORK

additives and procedures that reduce herbicide drift by 40 percent. **Penn State** Extension delivers training programs annually to educate pesticide applicators on a range of topics including how to limit and control pesticide drift. More than 4,000 new applicators are certified each year, and 24,000 receive refresher training. Learners improve their decision-making skills in protecting themselves, public health, plant and animal health, and the environment.

- **Inner space**. With 22,000 lung cancer deaths attributed to radon exposure in the United States, the EPA recommends radon testing of all homes, regardless of structure type or geographical location. **Georgia** Extension delivers information on the health effects of radon through its Radon Education Program. In one county, extension distributed more than 2,000 radon test kits to homeowners. More than 600 homes were tested. **North Carolina A&T State** Extension faculty offers the Children's Environmental Health Initiative to help limited-resource people understand asthma and respiratory health issues related to mold and moisture, pesticides and secondhand smoke. More than 23,000 youths participated in workshops and discussion groups and raised their awareness about these health risks. At the Fort Peck Reservation in Montana, Native American children are two to three times more likely to suffer from asthma than the general population. **Montana State** Extension educators developed the Native AIR (Asthma Intervention and Reduction) program, which delivers information on the triggers of asthma: molds, excessive moisture, pets, dust mites and secondhand smoke in the home. To date, 500 youths have participated.

- **It's a gas**. Global warming is a problem. Agricultural soils may be part of the solution. Greenhouse gases such as carbon dioxide are thought to be leading causes of global warming. **Kansas State** scientists are studying ways to reduce atmospheric carbon dioxide levels by storing more organic carbon in soils, a process called carbon sequestration. Researchers are evaluating best management practices for using cropland to store atmospheric carbon. The USDA estimates the nation's cropland can store about 75 million to 200 million metric tons of atmospheric carbon per year if current best management practices are implemented. **Colorado State**, **Iowa State**, **Michigan State**, **Montana State**, **Nebraska, Ohio State**, **Purdue**, **Texas A&M** and the Pacific-Northwest National Laboratory are cooperating on the project.

- **Raising air awareness**. Teaching young people about the importance of air and water quality is the crucial first step in helping the next generation of citizens and community leaders build a sense of environmental stewardship. **Kansas State** Extension educators developed the Earth Awareness Researchers for Tomorrow's Habitat curriculum and learning kit to introduce environmental education to Kansas school students and help them develop critical thinking and problem-solving skills. Currently 47 teachers are using EARTH program materials to teach 2,887 Kansas students who report the learning experience made them feel more qualified to be wise stewards of the environment. **Tennessee** 4-H offers a broad-based program called Natural Resources and the Environment. Activities range from 4-H camps and conferences to outdoor learning laboratories and in-school classroom programs. More than 6,000 youths participated in 2004. In program evaluations, 65 percent reported they will adopt practices and behaviors they learned including recycling, planting trees and taking care of the environment.

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